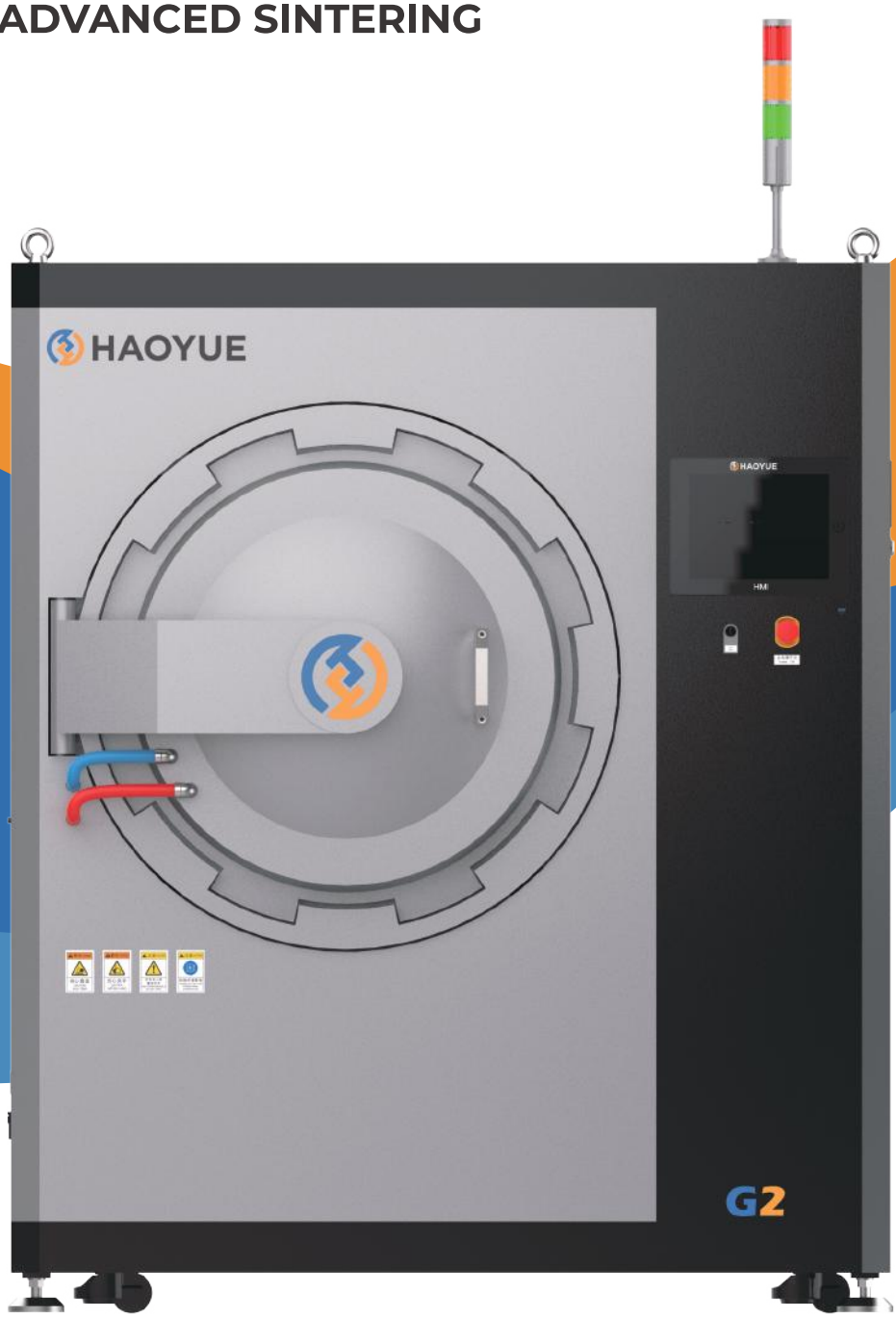
HAOYUE

BE AN

EXPLORER & PIONEER & LEADER

IN THE FIELD OF ADVANCED SINTERING



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COMPANY FROFILE >>>

HAOYUE TECHNOLOGY

Shanghai Haoyue Technology Co., Ltd (Haoyue Technology) was founded in 2009. It is a high-tech enterprise that integrates R&D, production, and sales. Our products cover three major fields: advanced ceramic composite material equipment, semiconductor material equipment, and lithium battery material & new energy equipment.

At present, the company has over 7000m² of factory building, a complete set of processing equipment, a strict quality management system, and an advanced equipment exhibition hall and an environmental treatment R&D center laboratory of over 1500m². The laboratory is not only for internal R&D but also for external universities, research institutions, and enterprises to conduct experimental research and development.

The company has focused on the industry, gathering a group of technical elites who have been engaged in the field for a long time. Currently, there are more than 100 staff members, including over 30 R&D personnel, more than 20 technical personnel, and over 50 sets of large-scale production equipment. Our business covers markets in Europe, America, the Middle East, and Southeast Asia. In addition, the company has maintained long-term scientific research cooperation with Fudan University, Tongji University, Harbin Institute of Technology, Nanjing University of Aeronautics and Astronautics, and other universities, jointly building industry-university research bases and talent training bases. At the same time, we have established cooperation with customers such as Huawei, Xiaomi, Ningbo Institute of Industrial Technology, Chinese Academy of Sciences, CATL, and others, providing them with high-quality products and services.

Haoyue Technology is located in the Yangtze River Delta, facing the whole of China, building an international brand, with more than 15 years of stable operation and efficient development, showcasing the continuous pursuit of Haoyue Technology. Significant business performance records the unremitting efforts of Haoyue Technology. Haoyue Technology always adheres to the core values of "integrity, focus, excellence, innovation, and long-term development", continues to adhere to the mission of "promoting the rapid development of heat treatment, creating value, and repaying society", and strives to become a leader in the field of new materials and new energy heat treatment.

From a high perspective, we strive for innovation, reliable quality, and honest service. Haoyue Technology looks forward to working together with you to create a better future!

EXPERIMENTAL VACUUM FURNACE PRODUCT SELECTION TABLE

Product Series	Numbering	Max. Temperature (°C)	Heater	Ultimate Vacuum (Pa)	Vacuum Pumps	Chamber Size (mm)	Overall Dimensions L×W×H(mm)	Weight (Kg)	Applications	Note
S Series Spark Plasma Sintering System	S1	2400°C	SPS	5	Direct Connection Pump	Φ60×180	1100×1290×1775	1200	Sintering	Servo pressure 5T, accuracy ±1‰, Heating rate 200°C/min, Compressible Φ20~30mm procucts
	S2	2400°C	SPS	5	Direct Connection Pump	Φ80×250	1425×1550×1850	1500	Sintering	Servo pressure 10T, accuracy ±1‰, Heating rate 200°C/min, Compressible Φ30~50mm procucts
V Series Vacuum Furnace Series	V2GR20	2000°C	GR	6.7×10^{-3}	Direct Connection Pump +Diffusion Pump	200×200×300	1425×1550×1850	1300	Sintering/Annealing/ Degreasing	Graphite furnace, Heating rate 20°C/min
	V2GR24	2400°C	GR	6.7×10^{-3}	Direct Connection Pump +Diffusion Pump	200×200×300	1425×1550×1850	1300	Sintering/Annealing/ Degreasing	Graphite furnace, Heating rate 20°C/min
	V2MO13	1300°C	MO	6.7×10^{-4}	Direct Connection Pump +Diffusion Pump	200×200×300	1425×1550×1850	1300	Annealing/Brazing Degreasing	Molybdenum strip furnace, Heating rate 10°C/min
	V2W20	2000°C	W	6.7×10^{-4}	Direct Connection Pump +Diffusion Pump	200×200×300	1425×1550×1850	1300	Sintering/Annealing/ Degreasing	Tungsten strip furnace, Heating rate 10°C/min
	V2CO20	2000°C	CO	6.7×10^{-3}	Direct Connection Pump +Diffusion Pump	Φ200×200	1425×1550×1850	1600	Sintering/Annealing	Induction furnace, Heating rate 100°C/min
	V2CO24	2400°C	CO	6.7×10^{-3}	Direct Connection Pump +Diffusion Pump	Φ200×200	1425×1550×1850	1600	Sintering/Annealing	Induction furnace, Heating rate 100°C/min
I Series Hot Isostatic Pressing Series	I1CC20	2000°C	C/C	10	Direct Connection Pump	Φ100×150	2000×1500×1730	4300	Hot isostatic sintering	Vertical, 200MPa gas pressure furnace, Heating rate 10°C/min
	I1MO14	1400°C	MO	10	Direct Connection Pump	Φ100×150	2000×1500×1730	4500	Hot isostatic sintering	Vertical, 200MPa gas pressure furnace, Heating rate 10°C/min
P Series Vacuum Hot Pressing Furnace Series	P2GR20	2000°C	GR	6.7×10^{-3}	Direct Connection Pump +Diffusion Pump	200×200×300	1425×1550×1850	1600	Hot Press/Sintering	Servo pressure 30T, Accuracy ±3‰, Heating rate 20°C/min, Compressible Φ20~80mm procucts
	P2GR24	2400°C	GR	6.7×10^{-3}	Direct Connection Pump +Diffusion Pump	200×200×300	1425×1550×1850	1600	Hot Press/Sintering	Servo pressure 30T, Accuracy ±3‰, Heating rate 20°C/min, Compressible Φ20~80mm procucts
	P2CO20	2000°C	CO	6.7×10^{-3}	Direct Connection Pump +Diffusion Pump	Φ200×200	1425×1550×1850	1700	Hot Press/Sintering	Servo pressure 30T, Accuracy ±3‰, Heating rate 100°C/min, Compressible Φ20~80mm procucts
	P2CO24	2400°C	CO	6.7×10^{-3}	Direct Connection Pump +Diffusion Pump	Φ200×200	1425×1550×1850	1700	Hot Press/Sintering	Servo pressure 30T, Accuracy ±3‰, Heating rate 100°C/min, Compressible Φ20~80mm procucts
G Series Gas Pressure Sintering Furnace Series	G2VGR20	2000°C	GR	10	Direct Connection Pump	Φ200×250	2000×1500×1730	3000	Pneumatic Sintering/ Partial Pressure/ Degreasing	Vertical, 10MPa gas pressure furnace, Heating rate 10°C/min
	G2HGR20	2000°C	GR	6.7×10^{-3}	Direct Connection Pump +Diffusion Pump	200×200×300	1425×1550×1850	1700	Pneumatic Sintering/ Hot Pressing Sintering/ Vacuum Sintering	Horizontal, 1MPa air pressure, 30T Hydraulic pressure, High vacuum integrated furnace, Heating rate 10°C/min
H Series Hydrogen Furnace Series	H2MO14	1400°C	MO	6.7×10^{-4}	Direct Connection Pump +Diffusion Pump	200×200×300	1425×1550×1850	1300	Reduction/Annealing/ Brazing	Hydrogen furnace, Heating rate 10°C/min
	H2W20	2000°C	W	6.7×10^{-4}	Direct Connection Pump +Diffusion Pump	200×200×300	1425×1550×1850	1300	Reduction/ Annealing/Sintering	Hydrogen furnace, Heating rate 10°C/min
D Series Diffusion Welding Furnace Series	D2MO14	1400°C	MO	6.7×10^{-4}	Direct Connection Pump +Diffusion Pump	200×200×300	1425×1550×1850	1500	Diffusion Welding/ Brazing/Degassing	Servo electric pressure 5T, Accuracy ±1‰, Heating rate 10°C/min, Compressible 160×180×160mm procucts
	D2GR20	2000°C	GR	6.7×10^{-3}	Direct Connection Pump +Diffusion Pump	200×200×300	1425×1550×1850	1500	Diffusion Welding/ Degassing/Sintering	Servo electric pressure 5T, Accuracy ±1‰, Heating rate 10°C/min, Compressible 160×180×160mm procucts

Note: The list of optional configurations is as follows:

1. MOD (Molybdenum Strip Furnace: Degreasing)
2. GRD (Graphite Strip Furnace: Degreasing)
3. H2RFC (Hydrogen Furnace, 2-way Float Flowmeter)
4. H2MFC (Hydrogen Furnace, 2-way Mass Flowmeter)
5. OM (Direct Connection Pump + Molecular Pump)
6. DM (Screw Pump + Molecular Pump)
7. UPS (Uninterruptible Power Supply)
8. AC (Air Conditioning)
9. OCA (Oxygen Content Analyzer)
10. HDP (Hydrogen Dew Point Meter)

Spark Plasma Sintering

S Series

- S1 Front View -

BRIEF INTRODUCTION

The SPS (Spark Plasma Sintering)/DCS discharge plasma sintering system is one of the most advanced sintering systems in the world today. It is a new type of technology that enables rapid sintering of powder materials by applying direct current pulses between two electrodes under a low-pressure atmosphere. It has distinct characteristics such as fast heating rate, short sintering time, controllable organizational structure, energy conservation, and environmental protection. It can be used to prepare metal materials, ceramic materials, composite materials, as well as nano bulk materials, amorphous bulk materials, gradient materials, etc. In addition, SPS/DCS equipment also provides the possibility for the manufacturing of very special new materials, such as nanomaterials, functional gradient materials, composite materials, tungsten carbide, silicon nitride, silicon carbide or other hard materials, structural ceramics and functional ceramics, which can be sintered without significant grain growth.

APPLICATIONS

- Metals: Fe、Cu、Al、Au、Ag、Ni、Cr、Mo、Sn、Ti、W、Be;
- Ceramic Oxides: Al_2O_3、ZrO_2、Mg、SiO_2、TiO、HfO_2;
- Carbides: SiC、B_4C、TaC、WC、ZrC、VC;
- Nitrides: Si_3N_4、TaN、TiN、AlN、ZrN、VN;
- Boride: TiB_2、HfB_2、LaB_6、ZrB_2、VB_2;
- Fluorides: LiF、CaF_2、MgF_2;
- Metal Ceramics: Si_3N_4+Ni、Al_2O_3+Ni、ZrO_2+Ni、Al_2O_3+Ti、SUS+WC/Co、BN+Fe、WC+Co+Fe;
- Metal Compounds: TiAl、$MoSi_2$、Si_3Zr_5、NiAl、NbCo、NbAl、Sm_2Co_{17}。

ADVANTAGES

The main features of SPS/DCS equipment of Haoyue company:

- This series of discharge plasma sintering systems fully considers the automation and control of the sintering process, and the automatic program control system such as heating temperature, pressure, insulation time, cooling rate, and current control is the standard configuration of the equipment.
- The equipment is equipped with a safe shutdown function, and the equipment will automatically stop when the equipment is in an abnormal condition or an emergency situation occurs, such as water temperature and mold damage.
- Based on the data acquisition and control system, a series of process parameters that determine the product quality such as voltage, current, vacuum degree, current change rate, measured temperature, and others can be saved and called to track the product production process.
- The equipment adopts a self-developed pulse variable frequency DC power supply, which greatly reduces power consumption compared with the traditional SPS of the same level, and can truly effectively reduce energy consumption and environmentally friendly high-grade sintering production.
- The front-opening water-cooled vacuum sintering chamber is adopted, which makes the operation convenient for the operator to get on and off the machine. The high-precision mold and die are easy to replace and maintain, and the cavity lining i wear-resistant.
- Using a large LCD touch control panel, it can display and confirm the display of displacement data linkage in real-time, set display, alarm history, pressurized pressure setting value, etc. at any time.
- In order to avoid misoperation of each operation button or button on the device, the device is equipped with a safety interlock function, which can be used with confidence even if a novice is on the machine.

- S2 Front View -

SPECIFICATIONS & PARAMETERS

Numbering	Model	Chamber Size (mm)	Sample Dia. (mm)	Pressure (T)	Indenter Stroke (mm)	Heater	Heating Power (kW)	Ultimate Vacuum (Pa)	Max. Temperature (°C)
S1	VHPsp-6/18-2400	Φ60×180	20~30	5	100	Pulsed DC Power Supply	30	5	2400
S2	VHPsp-8/25-2400	Φ80×250	30~50	10	100	Pulsed DC Power Supply	50	5	2400

Vacuum Furnace

V Series

- V2 Isometric View -

BRIEF INTRODUCTION

The vacuum furnace is a vacuum resistance furnace that can be used as a heating element with graphite/molybdenum/tungsten strip/tungsten strip/induction, etc., which is mainly used for ceramics, cemented carbide, composite materials, stainless steel, etc. for sintering, annealing, brazing, degassing, degaussing, etc. in vacuum or protective atmosphere, and can also be used for high-temperature heat treatment of metal materials under high vacuum conditions or degassing treatment of precious metal materials.

APPLICATIONS

It can be applied to sintering semiconductor materials such as silicon, SiC ceramics, germanium, etc., to obtain high-purity and high-performance materials, and make various ceramic products, such as structural ceramics, functional ceramics, etc., hot pressing molds, high-temperature heating elements/fasteners, thermal field materials, graphite products, graphene, carbon nanotubes, etc. There are many applicable processes, which can help scientific research institutes to carry out the research and development of new materials.

- V2 Front View -

ADVANTAGES

- **Easy to Operate:**
  Horizontal, all-in-one machine, side-opening door structure; high precision of loading and unloading molds, convenient equipment movement, and convenient operation; fast ramp and drop temperature.
- **Fast ramp and drop temperature:**
  Induction heating rate: 100°C/min (≤1600°C);
  resistance heating rate: 20°C/min (≤1600°C).
- **Good temperature uniformity:**
  The average temperature uniformity is ±5°C (5 point temperature measurement, detection after 1000°C insulation in the constant temperature zone for 1h).
- **Single-zone control:**
  Equipped with two temperature measuring holes for high temperature monitoring.
- **Good safety performance:**
  Adopt HMI+PLC+PID program temperature control, safe and reliable.
- **Scalability:**
  It can be sintered, brazed, annealed, degreased, dehydrogenated, degassed, reduced, etc.

SPECIFICATIONS & PARAMETERS

Numbering	Model	Chamber Size (mm)	Heating Power (kW)	Ultimate Vacuum (Pa)	Max. Temperature (°C)
V2GR20	VHSgr-20/20/30-2000	200×200×300	45	6.7×10^{-3}	2000
V2GR24	VHSgr-20/20/30-2400	200×200×300	50	6.7×10^{-3}	2400
V2MO13	VHSmo-20/20/30-1300	200×200×300	40	6.7×10^{-4}	1300
V2W20	VHSw-20/20/30-2000	200×200×300	45	6.7×10^{-4}	2000
V2CO20	VHSco-20/20-2000	Φ200×200	45	6.7×10^{-3}	2000
V2CO24	VHSco-20/20-2400	Φ200×200	50	6.7×10^{-3}	2400

Hot Isostatic Pressing Series

I Series

- I1CC20 Front View -

ADVANTAGES

Versatile uses:
HIP: powder metallurgy, densification, diffusion bonding.

HIP powder metallurgy:
· Design flexibility: design to almost the same shape as the final product, reducing raw material waste, machining procedures, and transportation time.
· The grain is fine and uniform, and it has isotropic material properties - wear resistance, corrosion resistance, improved mechanical properties, and long life.
· Uniform internal density - no effect from ultrasonic testing.
· No liquid phase - minimizes segregation and improves material corrosion resistance.
· Ingot blanks can be prepared from two different metals - the bimetal can still be forged and extruded.

Densification:
· Elimination of internal defects, elimination of shrinkage porosity, shrinkage porosity, and segregation.
· Greatly improve fatigue life, 10-100 times.
· Improved ductility and fracture toughness.
· The product can reach theoretical density.
· Wear resistance, corrosion resistance is greatly improved.
· Relieves internal stresses in the material.

Diffusion Connection:
· Used to connect parts with complex shapes on the contact surface and achieve metallurgical connection.
· Multiple homogeneous or dissimilar materials can be joined in one process.
· Large-area connections can be quickly realized.
· It can make brittle metals that cannot be connected by conventional welding methods, or metals with large melting points with large melting point differences, realize solid-state connection.
· Due to the high and uniform isostatic pressure acting on the part, the microscopic porosity or cracks on the outside of the connection zone are reduced and eliminated.
· There are no defects such as welds, heat-affected zones, surface porosity, inclusions, undercuts, cracks and other defects generated in the traditional welding process.

BRIEF INTRODUCTION

Hot Isostatic Pressing (HIP) is a special heat treatment process for metal or ceramic materials, which is an important means to prepare high-performance materials. This process technology can be used for powder metallurgy, moldings or densification of formed castings (titanium alloys, high-temperature alloys, aluminum alloys and other base shrinkage hole castings), using inert gas as the pressure transfer medium, the same pressure acts uniformly on the surface of the parts from all directions, eliminating the inherent internal defects of the product process, such as porosity, internal cracks, local porosity, etc., so as to improve the overall mechanical properties of the parts, especially the fatigue properties, while reducing costs and improving energy efficiency. After HIP treatment, the wear resistance, corrosion resistance and mechanical properties of the material will be greatly improved, and the fatigue life can be increased by 10-100 times.

APPLICATIONS

High-temperature alloys, titanium alloys, aluminum alloys, copper alloys, refractory metals, cemented carbides, stainless steel, corrosion-resistant alloys, ceramics, composite materials, electronic materials, functional materials, etc.

- I1CC20 Isometric View -

SPECIFICATIONS & PARAMETERS

Numbering	Model	Heater	Structure	Loading	Chamber Size (mm)	Max. Temperature (°C)	Gas Pressure (MPa)	Ultimate Vacuum (Pa)	Applications
I1CC20	IVScc-10/15-2000	C/C	Vertical	Top Loading	Φ100x150mm	2000	200	10	Hot Isostatic Sintering
I1MO40	IVSmo-10/15-1400	MO	Vertical	Top Loading	Φ100x150mm	1400	200	10	Hot Isostatic Sintering

Vacuum Hot Pressing Furnace

P Series

- P2 Isometric View -

BRIEF INTRODUCTION

Vacuum hot press furnace is a complete set of equipment for hot pressing and forming materials under vacuum, or other atmosphere conditions, mainly using resistance or induction heating, and pressurizing up and down the pressure head driven by the oil cylinder. At high temperature, the material's green solid particles bond with each other, the grain grows, the void (pore) and grain boundary gradually decrease, through the transfer of matter, its total volume shrinks, the density increases, and finally becomes a dense polycrystalline sintered body with a certain microstructure, so as to press the material into shape.

APPLICATIONS

It is suitable for high-temperature hot forming of new materials such as functional ceramics (niobium oxide, silicon carbide, boron carbide, boron nitride, etc.), cemented carbide (high-temperature pressure sintering forming and densification of high-temperature alloy metal powder materials), powder metallurgy, etc., and can also be used for heat treatment of powder or pressed blank at a temperature lower than the melting point of the main components, with the purpose of making the material more dense and improving the strength, hardness and wear resistance of the material through hot pressing and sintering.

- P2 Front View -

ADVANTAGES

- Horizontal, all-in-one machine, side-opening door structure: high precision of loading and unloading molds, convenient equipment movement, and convenient operation.
- Fast heating rate: induction heating rate 100°C/min (≤1600°C), resistance heating rate 20°C/min (≤1600°C).
- Good temperature uniformity: the average temperature uniformity is ±5°C (5-point temperature measurement, detection after 1000°C insulation in the constant temperature zone for 1h).
- High pressure accuracy: using hydraulic control system, the pressure accuracy is 3%.
- Single-zone control: two temperature measuring holes are reserved for high temperature monitoring.
- Good safety performance: HMI+PLC+PID pressure sensing control, safe and reliable.
- Good sealing performance: the dynamic indenter is sealed with bellows to ensure no air leakage.

SPECIFICATIONS & PARAMETERS

Numbering	Model	Sample Dia. (mm)	Mechanical Pressure (T)	Heating Power (kW)	Ultimate Vacuum (Pa)	Max. Temperature (°C)
P2GR20	VHPgr-20/20/30-2000	Φ20~80	30	45	6.7×10^{-3}	2000
P2GR24	VHPgr-20/20/30-2400	Φ20~80	30	50	6.7×10^{-3}	2400
P2CO20	VHPco-20/20-2000	Φ20~80	30	45	6.7×10^{-3}	2000
P2CO24	VHPco-20/20-2400	Φ20~80	30	50	6.7×10^{-3}	2400

Gas Pressure Sintering Furnace

G Series

- G2VGR20 Isometric View -

BRIEF INTRODUCTION

Gas pressure sintering refers to the first sintering process under low pressure, then sintering the material to reach the fatigue state under atmospheric pressure, and then sintering under high air pressure (the result is to further increase the fatigue state of the material and quickly eliminate the stress in the material), after the high temperature and high pressure sintering process, all aspects of the mechanical properties of the material (hardness, strength, toughness, etc.) are better than the ordinary sintering process.

APPLICATIONS

Structural ceramics (such as silicon carbide, zirconia, alumina, silicon nitride, etc.), functional ceramics (such as the preparation of piezoelectric ceramics, magnetic ceramics, etc.), metal materials (such as cemented carbide), composite materials, etc. are sintered under the conditions of high pressure, nitrogen or argon atmosphere under the condition of high pressure protective atmosphere. It is conducive to increasing the sintering density of the material, improving the mechanical properties of the material, and is also suitable for the medium experiment and process confirmation of colleges and universities and scientific research units.

ADVANTAGES

Gas pressure sintering equipment is particularly suitable for sintering ceramics or metals that are easy to decompose at high temperatures or that cannot be sintered by standard sintering processes. As with hot sintering, there are no restrictions on the treatment of the sintered parts or restrictions on geometry in this process, which provides an advantageous option for the more expensive HIP process.

Our Gas pressure sintering furnaces can be equipped with an integrated thermodilatometer that measures shrinkage and shrinkage velocity during the sintering cycle. The measurement data obtained here is used for process control.

At 2000°C and 10 MPa (in N2 or Ar) it is possible to achieve a workload of 1 liter to 500 liters.

Gas pressure sintering furnaces are used to produce the following materials or components:

- Sintered silicon nitride and silicon-aluminum oxynitride polymers with good mechanical properties (e.g. cutting tools, turbocharger engines, engine components).
- Silicon carbide ceramics (parts with high mechanical stress under corrosive conditions, etc.).
- Superalloys (mechanically stressed parts for high-temperature applications).
- Hard metals in special sintered calcium carbide with a low cobalt content, with the best mechanical properties and high quality general composite materials, are mainly used in the automotive industry to produce SSN batch parts.

- G2HGR20 Isometric View -

Haoyue Technology's new product launch in 2024: G2HGR20 multi-functional all-in-one furnace.

This equipment has a multi-functional furnace integrating three sintering processes, such as hot press sintering, Gas pressure sintering, and vacuum sintering (one equipment can replace three sets of hot press furnace, gas pressure furnace, and vacuum furnace), which can realize the three functions of 30T mechanical pressure, 1MPa air pressure, and high vacuum ($6.7x10^{-3}$ Pa). It is a new product launched by Haoyue Technology in 2024, which has the advantages of high safety, multiple functions, small footprint, high pressure accuracy, fast heating speed, and simple appearance.

SPECIFICATIONS & PARAMETERS

Numbering	Model	Heater	Structure	Loading	Chamber Size (mm)	Max. Temperature (°C)	Pressure (MPa)	Ultimate Vacuum (Pa)	Heating Power (kW)
G2VGR20	PVSgr-20/25-2000	GR	Vertical	Top Loading	Φ200×250	2000	10MPa Gas Pressure	10	50
G2HGR20	PHPgr-20/20/30-2000	GR	Horizontal	Side Loading	200×200×300	2000	30T Hydraulic Pressure 1Mpa Gas Pressure	6.7×10^{-3}	50

Vacuum Hydrogen Furnace

H Series

- H2 Isometric View -

BRIEF INTRODUCTION

Vacuum hydrogen furnace is a vacuum resistance furnace with molybdenum strip as a heating element, which is mainly used for high-temperature sintering of ceramics, cemented carbide, composite materials, etc. In vacuum or protective atmosphere, and can also be used for high-temperature heat treatment of metal materials under high vacuum conditions or degassing treatment of precious metal materials. The structure design of the equipment is advanced and reasonable, and the design and manufacture conform to the corresponding national and industry standards and specifications, which can meet the requirements of users. It's supporting products and components are at the international advanced level, which can adapt to long-term, stable, and reliable production needs. The energy saving effect of the equipment is good. It is convenient and simple to use, operate and maintain, beautiful in appearance, safe and reliable, and excellent in after-sales service.

APPLICATIONS

It is suitable for ceramic sintering or metallization, brazing, annealing, and purification of metal parts for sealing glass parts, etc. It is mainly used for the heat treatment of tool steel, high-speed steel, ultra-high strength steel, magnetic materials, stainless steel, non-ferrous metals, and other materials in a hydrogen atmosphere.

- H2 Front View -

ADVANTAGES

- The furnace body adopts a horizontal structure, and the unique furnace structure makes the air flow distribution uniform and the service life is uniform, and the shell material is made of double-layer SUS304 stainless steel.
- The heating element is made of molybdenum strip with excellent mechanical properties at high temperatures, and its surface load is determined within a reasonable range. The furnace body adopts a horizontal structure, which has fast heat transfer, simple and fast maintenance and replacement.
- Fast heating and heating rate: 1~15°C/min (≤1400°C), 1~10°C/min (>1400°C).
  Good design optimization: The thermal field of the heating chamber is calculated by thermal simulation, with very high temperature uniformity, and the configured heating elements and thermal insulation layer adopt modular optimization design.
- This equipment has the characteristics of low investment, low operating cost, simple installation, easy use and maintenance, high safety performance and good adjustment performance.
- **High safety:** with over-temperature and over-pressure and other fault alarms, mechanical automatic pressure protection, action interlock and other functions, the equipment has high safety.

SPECIFICATIONS & PARAMETERS

Numbering	Model	Chamber Size (mm)	Heater	Heating Power (kW)	Ultimate Vacuum (Pa)	Max. Temperature (°C)
H2MO14	VHHmo-20/20/30-1400	200×200×300	MO	40	6.7×10^{-4}	1400
H2W20	VHHw-20/20/30-2000	200×200×300	W	45	6.7×10^{-4}	2000

Vacuum Diffusion Welding Furnace

D Series

- D2 Isometric View -

BRIEF INTRODUCTION

Diffusion welding refers to a solid-state welding method in which a workpiece is heated and held at a high temperature, but does not produce visible deformation and relative movement. Diffusion welding is especially suitable for the joining of dissimilar metal materials, heat-resistant alloys, and new materials such as ceramics, intermetallic compounds, composite materials, etc., especially for materials that are difficult to weld by fusion welding methods. Diffusion welding has obvious advantages and has attracted more and more attention.

APPLICATIONS

Diffusion welding is especially suitable for small parts that require vacuum sealing, equal strength of joints and base metals, and no deformation. The welding of metals and non-metals in vacuum equipment, and the welding of cemented carbide, ceramics, high-speed steel and carbon steel in cutting tools all adopt diffusion welding methods. It is also particularly suitable for welding dissimilar metal materials, non-metallic materials such as graphite and ceramics, dispersion strengthened superalloys, metal matrix composites and porous sintered materials.

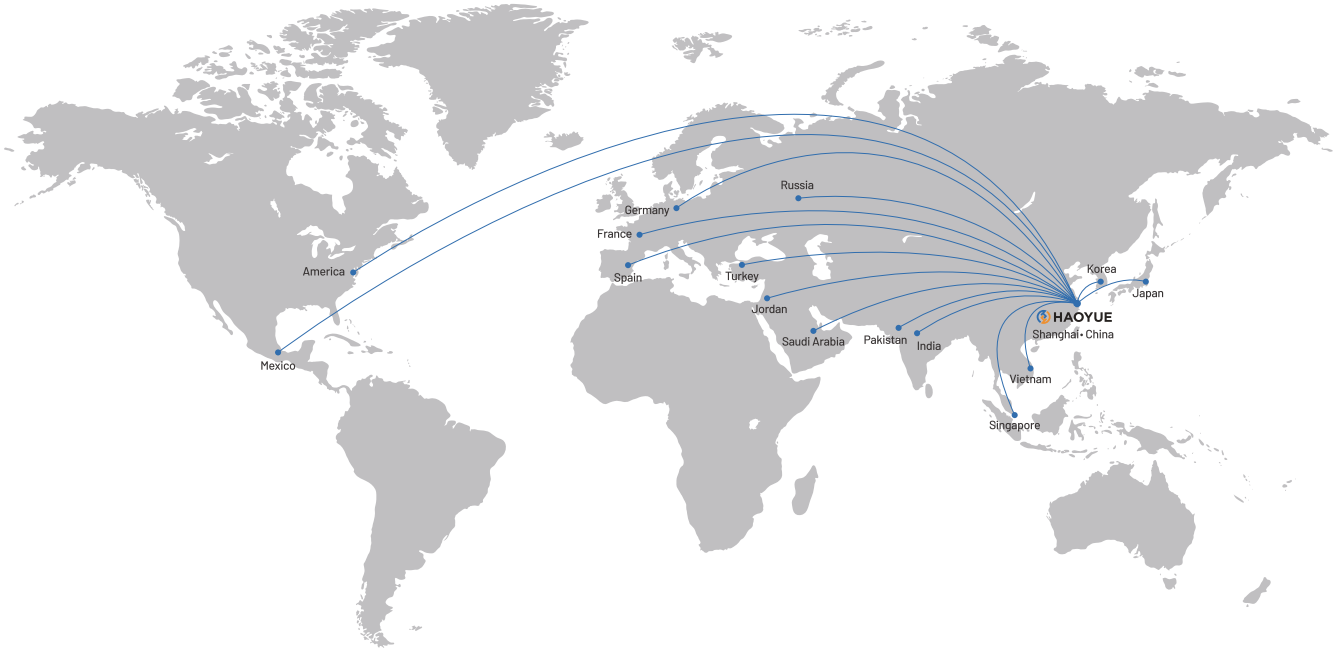
ADVANTAGES

- Due to the fact that the matrix is not overheated and does not melt during diffusion welding, almost all metals or non-metals can be welded without reducing the performance of the welded materials, and it is especially suitable for fusion welding materials that are difficult to weld by other methods, such as active metals, heat-resistant alloys, ceramics and composite materials. Diffusion welding is a more suitable welding method for the same material with poor plasticity or high melting point, as well as dissimilar materials that are immiscible or produce brittle intermetallic compounds during fusion welding.
- The diffusion welding joint is of good quality, its microstructure and properties are close to or the same as that of the base metal, and there are no fusion welding defects in the weld, and there is no overheating structure and heat-affected zone. The welding parameters are easy to control precisely, and the joint quality and performance are stable during mass production.
- The weldment has high precision and small deformation. Because the pressure applied during welding is small, the workpiece is mostly heated as a whole and cooled with the furnace, so the overall plastic deformation of the weldment is very small, and the welded workpiece is generally no longer machined.
- The pressure required for welding large-section workpieces is not large, so the tonnage of the equipment required for large-section welding is not high, and it is easy to realize.
- Suitable to weld workpieces with complex structures, inaccessible joints, and large thickness differences, and can weld many joints in the assembly at the same time.

- D2 Front View -

SPECIFICATIONS & PARAMETERS

Numbering	Model	Chamber Size (mm)	Heater	Ultimate Vacuum (Pa)	Mechanical Pressure (T)	Max. Temperature (°C)	Applications
D2MO14	VHDBmo-20/20/30-1400	200×200×300	MO	6.7×10^{-4}	5	1400	Diffusion Welding/ Brazing/Degassing
D2GR20	VHDBgr-20/20/30-2000	200×200×300	GR	6.7×10^{-3}	5	2000	Diffusion Welding/ Degassing/Sintering



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